



Duck keeping in the tropics

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Summary

This technology describes management practices involved in successful rearing of ducks in the tropical regions. Advantages and disadvantages of duck keeping compared to chickens are provided along with clarifications on the different types of breeds. Different processes of breeding and breeding stock are explained as well as explanations on how to management them which include flock maintenance, culling systems, egg incubation, flock trait selection and sexing. How to daily care for the ducks is also detailed as well as drinking water systems, feed, a guide to the construction duck keeping systems, housing, night shelters, flooring and feeding troughs.

Description

1. Introduction

About 700 million ducks are kept around the world. The majority of these, more than 500 million, are found in Asia. Despite this uneven distribution, it is certainly also possible to raise ducks in other parts of the world, including Africa and Latin America. Ducks can be reared for eggs and meat, for own use or for sale. Other products from ducks, which can also be sold, include down, feathers and fattened livers (foie gras). There are many similarities between chicken and duck rearing. The most obvious similarities

are found in the type of products for which these forms of poultry are kept. Ducks, like chickens, are good producers of eggs and meat. Breeding is largely similar for both. Ducks have approximately the same housing requirements as chickens, especially when they only require night shelter. If the ducks are outside during the day, just like chickens they will be capable of searching for a large part of their food.

There are many advantages of ducks compared with chickens.

- Ducks are tougher than chickens; they require less attention than chickens and are less likely to be sick than chickens.
- Ducks are larger than chickens, so if they are reared for meat there will be more to sell. Duck eggs are also larger than chicken eggs.
- Ducks do not necessarily need supplementary grain and maize. Chickens normally do need supplementary high-quality feed. Ducks eat more vegetable material and insects than chickens. Ducks also eat snails.

There are also disadvantages of ducks compared with chickens.

- Both duck meat and eggs taste different from those

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of chicken. Not everyone likes the taste of duck. If the taste is disliked by a lot of people it will be difficult to sell duck products. Not only does duck meat taste different it also looks different from chicken meat.

- Chicken meat is white whereas duck meat is red and dark. Lastly, duck meat is also fatter than chicken meat. Although this is listed here as a disadvantage, it is not necessarily the case. In many areas, fatty meat is considered a delicacy.

Ducks are water birds and need water to be able to breed and grow well. A pool or pond of water can take up a lot of room. A trough of water can also be provided so that ducks can bathe. If it is not possible to keep ducks near water the whole day it is sufficient to place a tub of water out for them in the mornings and evenings so that they can wash. Pools, ponds, troughs or tubs of water all need to be kept clean and hygienic. Different sorts of ducks differ in their water requirements. Muscovy ducks, sometimes called Barbary ducks, have less need to cool themselves and so have less need for a constant supply of bathing water. Peking ducks come originally from colder climates and live near to water. These ducks need water to keep their body temperature at the right level.

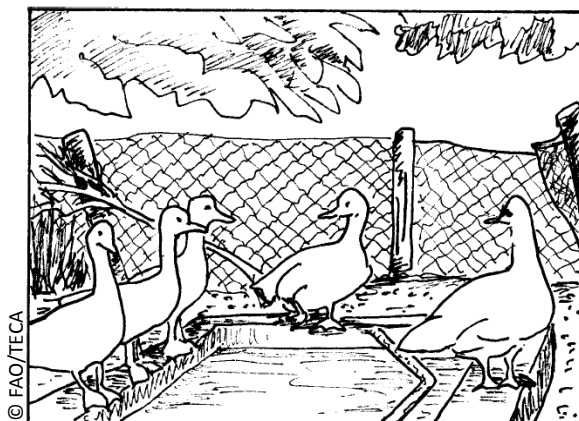
2. Breeds and breeding. Breeds and choice of breed

When starting with duck rearing you need to acquire ducks. This is when you will choose a breed.

If there is a choice of breeds available then you need to consider whether your production objectives are eggs, meat or both. If you decide to rear ducks for egg production then you need to have good laying ducks. These are usually smaller and

lighter than birds reared solely for meat production (for fattening). They make up for their lack of growth and weight by being better layers: on average laying ducks lay more eggs than ducks for fattening. Ducks for meat (broilers) are generally larger and heavier, and the number of eggs they lay is of less importance. If you consider an intensive production system with rapid growth, meat ducks are slaughtered before they have even reached the age at which they can produce eggs.

Figure 1. Ducks near a pond of water



In many forms of farming, especially small-scale farming, egg production as well as meat production will be important. A duck that is a good layer but also can produce a nice amount of meat is best for this kind of farming. As mentioned above, you may not have a choice of breed. In this case you simply use the duck breed which is easiest to come by. The advantage to using locally available ducks is that you can always obtain them if you need to replace or increase numbers.

Duck keeping is more common in Asia than in Africa or Latin America, which means that there are more different breeds available there. Each breed of duck is well adapted to the conditions in the area from which it originates.



2.1 The Muscovy or Barbary duck

This duck comes originally from Central America. The Muscovy duck is good for meat production. It is easy to recognize by the red, fleshy protuberances around the beak and eyes. It is important to know that the Muscovy duck is originally a tree dweller and therefore can fly. In order to prevent these ducks from flying away their wings need to be clipped. Use a pair of scissors to cut most of the large feathers of one wing. A Muscovy duck used for fattening can reach a weight of 3 to 5 kg.

The Muscovy duck does not grow very quickly and its final weight depends on the way it is kept and the feed it gets. The meat of the duck is fairly lean. In areas where fattier meat is preferred then it is probably better to choose a different breed. The duck starts laying eggs at about seven months. There are two clear laying periods with a break of 12 weeks. The first lasts 30 weeks and the second 22 weeks. The duck hatches and raises ducklings reliably, which makes them valuable to small-scale farmers.

Figure 2. Muscovy duck



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2.2 The common duck. Group of various breeds

This group includes various breeds, which originate from Asia and have been imported into Africa.

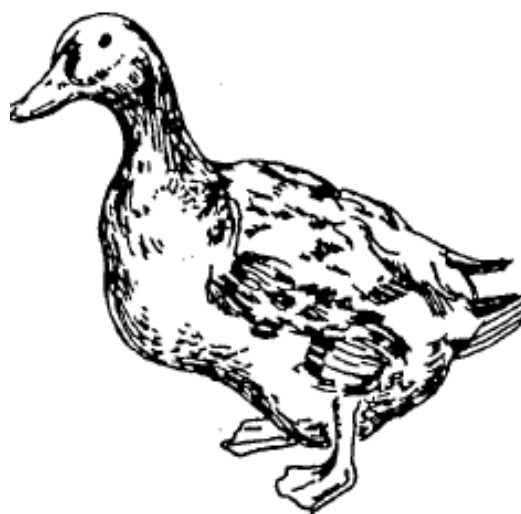
2.2.1 Khaki Campbell duck

The khaki (beige) coloured duck originated from England from and is a cross between the Indian 'Runner' and the Rouen duck. The Khaki Campbell is well suited to a tropical climate. Under good conditions this breed is capable of laying up to 250 to 300 eggs per year. In Asia the breed is used for improving the productivity of local breeds.

2.2.2 Rouen duck

The Rouen duck originated from France and is a reasonably heavy breed with good layers. The drake (male) is light grey with a green neck and the female is light brown like mallards (wild ducks).

Figure 3. Khaki Campbell duck



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2.3 Peking ducks

A Peking duck is a completely white duck that originally comes from cool climates in China. This breed is a meat and egg producer like the Muscovy duck. The Peking duck grows quicker than the Muscovy duck. One of the characteristics, which indicate that the Peking duck is good for meat production, is that it can reach a weight



of 3 kg by the age of seven to nine weeks. Drakes usually attain a maximum weight of 3.5 to 4 kg and females 3 to 3.5 kg. Peking ducks lay eggs from an age of five to six months and can lay more than 200 eggs a year. Peking duck meat is quite fatty, unlike that of the Muscovy duck. It is a quiet breed that tends to walk rather than fly. Incidence of brooding behaviour is rare.

2.4 Cross-breeds

Breeds are regularly crossed in an attempt to obtain a combination of good characteristics of two different breeds. Sometimes the results of cross-breeding are used for further breeding themselves, sometimes new crosses are made each time.

There are a number of standard cross-breeds.

- A Peking drake is crossed with a female Khaki Campbell. This is a cross between a good meat producer and a good layer. In this way the cross-breed should combine good meat production with good egg laying. First and second generations (referred to as F1 and F2) are used quite commonly. Further generations are not generally used, as the improvements obtained by crossing usually start to decline by that stage.
- The mule duck is a cross between a Muscovy drake and a female common duck. As these are two different species the resulting mule duck is sterile and does not lay fertile eggs. The mule duck is a quick fattener and is used especially for this purpose.

2.5 Other breeds

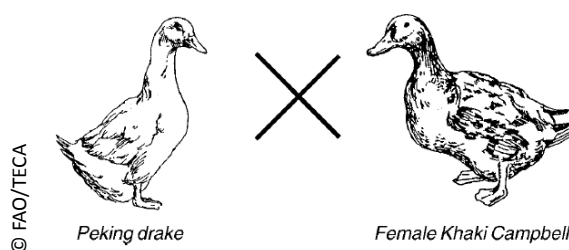
In addition to the breeds described above there are many more breeds and crosses.

- Indian runner duck (from India)

- Nageswari (from India)
- Chinese duck (from Indochina)
- Java duck (from Malaysia and Indonesia)
- Brown and White Tsaiya (from Taiwan)

Most duck breeds come from Asia and are kept for egg laying. These breeds are therefore generally not very large, the adult weight being between 2 and 3 kg.

Figure 4. A common cross



3. Breeding

Once you have obtained a number of ducks of the selected breed, you need to consider how you will maintain productive ducks over a longer period. Choose one of the following three options.

- If you keep ducks purely to sell their eggs and you buy ducklings whenever you need them, you will only need female ducks.
- If you intend to breed your own ducks then you need drakes as well to ensure that you have some fertile eggs.
- If you are keeping ducks for meat you have to make sure that you keep enough adult ducks for laying eggs so that you have a supply of ducklings.

There are many advantages to breeding ducks.

- You are not dependent on other suppliers of young ducks.
- You don't have to spend money on buying ducklings.
- You don't import diseases with the ducklings.



There are also disadvantages to breeding ducks.

- You have to incubate eggs, which cannot be sold. You have to spend time and money on incubating eggs.
- The effort of incubating eggs may be wasted if they don't hatch.
- Although you want only eggs, you will have to keep and feed unproductive drakes (males) as well, in order to obtain fertile eggs. For small-scale farmers it is more profitable to breed ducks themselves especially if the numbers of ducklings they need are small.

3.1 Two ways of breeding

3.1.1 Free breeding

If you keep the female ducks and drakes together then getting fertile eggs or ducklings will usually be no problem. The drakes are free to mate with any duck they want. However, in this way, you will have no idea of which drake has fertilised which ducks.

3.1.2 Directed breeding

You can also direct the process yourself so that you combine the ducks with the most desirable characteristics. In this way you keep ducks especially for producing ducklings. These are known as breeding stock. The extent to which you can determine which drake pairs with which duck depends on how you keep your ducks. If the ducks are only kept inside at night but are allowed to wander around freely at daytime in search of food then it is very difficult to even know which duck has paired with which drake.

If you keep ducks in this way it is not worth spending much time trying to determine partner choice. The best thing to do is to put a number of good drakes into the flock

and let them go their own way. This is the most simple and natural way of ensuring that you will have ducklings. If you have the possibility and time, then you could consider making separate sections in shelters, so that you can put one drake together with four to eight ducks so that they can mate.

3.2 Breeding stock

Breeding stock are ducks with desirable characteristics which you like to see in the ducklings. For example you may choose to combine a drake that grows well and has a good amount of meat, with a duck that is a good layer. Bear in mind, however, that not all characteristics are passed on from the parent duck to its offspring, but generally speaking the chance of breeding good ducklings is greater if good parents are used. Characteristics that you are looking at can be production characteristics or external characteristics.

3.2.1 Production characteristics

Most of the characteristics which are related to production are about quantity: the number of eggs, the weight of meat, etc. An important feature of these characteristics is that the environment influences them. These you can influence yourself as duck keeper. A duck which is bred for high meat production will only be able to achieve high production levels if it gets enough food.

If you want to increase your production levels you should first look carefully at your food supply, sickness levels and housing. Once you have made sure that you have the best food available, and that your ducks are healthy and have good housing, only then you can start breeding for a better production.



3.2.2 External characteristics

External characteristics may also be important, such as foot quality. If a number of ducks in a flock have bad feet it is better not to use them for breeding as they can pass this characteristic on to their young. External characteristics are not influenced by the amount of feed or housing. A duck will either have straight feet or not, or brown colour or not, so it is easy to use this kind of criterion for selection.

4. The management of female ducks and drakes

To ensure that you have enough fertile eggs, a good ratio is one drake to six female ducks in meat-type ducks. In egg-type ducks you can put drake the chance of fertile eggs increases, but less than four female ducks per drake is not recommended. A relatively large number of drakes in a flock makes the whole flock restless. It also means that you have more drakes to feed. Sell them as soon as they are grown up.

In Muscovy ducks, introduce drakes into the flock about a month before you require fertile eggs. This ensures that enough pairing has taken place for the ducks to lay fertile eggs. In common ducks like Peking ducks you have to make sure that males and female keep their sexual behaviour. Therefore, they have to be kept together from three weeks of age.

Give ducks access to water. Ducks are water birds and they can keep themselves clean (and therefore healthier) if there is water in which they can bathe. Brooding ducks that can keep themselves clean are better able to maintain the right level of humidity for the eggs. It is often thought that mating can only take place on the water. But access to water does not improve fertility. Bathing is

not necessary for Muscovy ducks as these are originally tree-dwellers. Remember that sitting water can also be a source of disease.

4.1 Maintaining a flock

There are two ways of obtaining and keeping a flock of ducks with the best possible features. Both methods should be practised at the same time.

- Selecting ducks and drakes for breeding (see above)
- Culling (removing) unhealthy ducks or low producers.

Culling means removing from the flock. Dispose first of ducks that are so sick that you can no longer treat them or that are not worth treating (see section 6 for more information on health care). It is also worth getting rid of ducks which have already gone through several laying cycles and are not so productive any more. They make way for younger ducks.

Once this has been done, further culling will be of ducks that possess undesirable characteristics such as those that do not produce enough. Do not breed with ducks that have bad layers or do not fatten well, as there is a chance that they will pass these characteristics on to their young. The decision when to cull, especially older ducks, will depend largely upon when new ducklings are available. There are three different ways to practice culling.

4.2 Culling systems

4.2.1 Continuous system

In this system a few new ducklings are added regularly to the flock. The ducks are not separated into age groups as there are no clearance groups. Besides watching for sick ducks you also have to keep an eye on the older ducks and remove them once they become unproductive.



4.2.2 All-in-all-out

The whole flock is renewed at regular intervals. In this system you do not have to check which ducks have become too old as all ducks are the same age. You should still check for sick ducks and remove them immediately. If you use this system you will often have different groups of ducks at different stages of production. This way you avoid being a situation where you have no ducks, and therefore no production, at all. Intensive production systems use age groups.

How many ducks you can cull will depend on the number of ducklings you can raise with each laying cycle. You have to be careful that the number of the flock does not decrease too much if you want to maintain your production at a constant level. If you remove more breeding animals than you can replace your production will go down.

4.3. Ducklings

Since the production period for meat is short and the growth is fast, you need a secure supply of ducklings. You may buy day-old ducklings on the market that are hatched in an incubator. Or you may have ducks that become broody easily and hatch the eggs of your own flock.

If the duck is going to incubate the eggs herself, the nest needs to be ready in time to give the duck a chance to get comfortably installed on it. She will take care of the eggs and you don't have to worry much because the duck will make sure that the circumstances are right for the eggs.

If you have to raise the ducklings from an incubator in a brooder, you need to have it ready in time. You then need to keep a

close watch on the temperature. It requires technical equipment, which has to be used accurately. Unforeseen occurrences such as an electricity failure or running out of fuel can lead to disaster. For this reason, you need to consider carefully the advantages and disadvantages of natural versus artificial hatching as well as what the costs are in terms of money and time and what the expected returns are.

4.4 Incubating eggs the natural way

Hatching eggs the natural way means that they are incubated by a duck. The big advantage to this method is that the eggs require little time and attention. The most important requirement is that the duck that is going to incubate the eggs is sufficiently broody. Being broody means having the urge to stay sitting on the eggs until they hatch. You can tell whether a duck is broody or not by how long she remains sitting on the eggs. The eggs cannot be left alone for more than 15 minutes as they must not cool down too much. The ducklings then cannot develop. Most ducks will sit on their own eggs. However, it is also possible to let one duck from the flock sit on eggs which have been laid by other ducks. In this way about 12 eggs, which were laid at the same time, can be incubated by one duck.

The Muscovy duck has good broodiness and maternal instincts. It can therefore be used for incubating the eggs from other types of duck. The Muscovy duck is also larger than many other types, so it can incubate more eggs at once. You will have to see how many eggs fit underneath a Muscovy duck, but 12 to 15 should fit easily. Chickens can also be used to incubate duck eggs and vice versa. Because duck eggs are larger than chicken eggs a chicken will only be able to incubate 8 to 11 duck eggs at most.



4.5 Some info on hatching in an incubator

An incubator is a box with trays inside on which the eggs can be put. An incubator must be able to take the place of a female duck. It must keep eggs at a constant temperature, right humidity and proper ventilation. Incubators come in many different shapes and sizes, and it is possible to make a small-scale incubator yourself. Making and using incubators is described extensively in Agrodok 34 'Hatching eggs by hens or in an incubator'. Although the Agrodok is mainly about chickens, much of what is written also applies to ducks. The text indicates where ducks have different requirements. Figure 5 shows an example of a simple incubator.

The temperature needs to be about 38°C (see Table 1). If the temperature is lower or higher the duckling will not develop properly. At best the ducklings develop too slowly but will hatch. In the worst case, the ducklings die before they hatch. When ducklings hatch they need a temperature of about 30 to 32°C. In colder areas you can reduce the temperature by 1°C each day afterwards.

Table 1. Artificial incubation of duck eggs

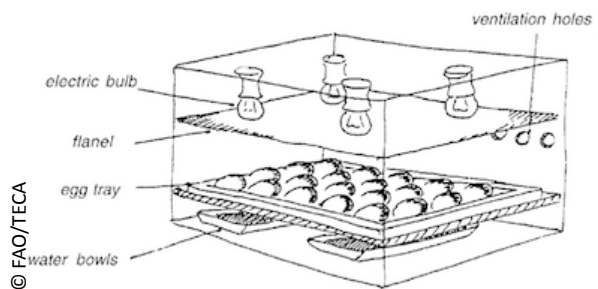
Day in incubation per period	Temperature	Number of times to turn per day
01 - 24	38	5
24 - 26	38	5
26 - 28	37.5	0

Source: FAO 2010

An incubator needs good ventilation and must be able to maintain humidity. The air humidity must be quite high, although at the beginning of the incubation period

it must not be too high. This is because part of the moisture in the egg needs to evaporate, otherwise the embryo will drown in the egg fluid. If it is too low at later stages it may result in eggs becoming too dry.

Figure 5. A small incubator



4.6 Length of incubation

Nearly all types of ducks take about the same amount of time to hatch their eggs. Generally, duck eggs need to incubate for between 25 and 28 days before they hatch. You can expect most breeds to take about 28 days. Muscovy duck eggs take longer to hatch, about 35 days, and Mule duck eggs usually take about 32 days.

4.6.1 Advantages of producing eggs artificially

- A lot of eggs can be incubated at the same time. May be even enough to allow you to sell day-old ducklings to others.

4.6.2 Disadvantages of producing eggs artificially

- Investments are needed to buy or build an incubator.
- Time is needed to vigilate the process, to make sure the temperature and humidity are at the right levels and that nothing goes wrong with the heat supply.
- In case you choose an electrical heat source, power cuts can easily result in a disaster.



- Artificial incubating requires experience, especially in the beginning the risk of eggs not hatching or ducklings dying is very big.

If you do not incubate more than 100 eggs at a time (one production cycle) it is not worth risking so much effort and investment. In most cases you make the best of things letting the female ducks do the job they are very good at, which is incubating their and other's eggs and taking care of the ducklings. Artificial incubation can best be left to professionals to market ducklings and day-old chicks. They can turn to Agrodok 34 for information on incubator construction and management.

4.7 Selection in flock traits

The time of hatching is an important moment for selection in your flock. By selecting eggs you determine the traits of your future flock.

Eggs from good layers will in general produce good layers. Broodiness, feather colours and body traits will inherit also. Good layers will not be broody very often. If you make use of the difference in broodiness of different strains or individuals, you will breed more layer ducklings in the end. You select eggs from the best layers, or other traits, and replace the eggs of the broody hen by them, as soon as she sits permanently.

4.8 Methods for sexing at a later stage

If you want to rear the ducklings until they have been fattened and then sell them, you can also use other methods.

4.8.1 Watching the colours of the feathers

Ducks and drakes of some breeds have different colours which makes it easy to tell them apart.

4.8.2 Voice

There is a clear difference in the noise made by ducks and drakes. This is noticeable from about four to six weeks of age. A female duck makes a clear 'quack' sound, while a drake makes a deeper and more hoarse sound.

4.8.3 Tail feathers

The tail feathers of most fully-grown drakes have a clear curl at the end. Female ducks do not have this. The only breed that does not show this distinction is the Muscovy duck. However Muscovy drakes are much bigger than the females, so it is also easy to determine sex in this breed.

5. Caring for the ducklings

Ducklings, which have been hatched naturally, require sometimes protection. The duck that hatched them will look after them until they are old enough to look after themselves. But the duck cannot deter all predators. Sometimes duck and ducklings must be kept enclosed during the first weeks for protection against predators.

Day-old-ducklings you buy (hatched in an incubator) need extra attention. You need to pay attention to warmth, water/feed and ventilation. Newly hatched ducklings cannot maintain their own body temperature so you have to keep them warm.

The most favorable time for raising ducklings is during the rainy season. During the first 10 to 14 days ducklings are kept in several baskets with about 5 cm of rice husks or straw at the bottom of the basket. This is changed frequently to keep the ducklings dry and comfortable. The basket is covered with a loosely woven jute bag to protect the ducklings from cold at night. The ducklings are kept at about 28 °C for the first 10 to 14 days. Ducklings start eating one day after



hatching and they grow rapidly. They are fed boiled rice, broken rice, rice bran, oil cake, chopped earth worms, snails, fish, green vegetables or water plants and crushed wheat. Feeding is done in a separate (single) basket. After feeding they are put on a dry jute bag or on a layer of husk or straw in a separate basket until they have dried off. They are then returned to their original baskets.

As an alternative to the basket you can choose a circular chicken wire floor covered with straw and an external heat source. You can keep them close to the heat source by bending a flexible board around the ducklings in a circle (see Figure 7). Elevate the wire floor from the ground to improve ventilation and to remove manure. The heat source can be a stove with slow burning sawdust or an electrical lamp shining in a clay pot or an infra-red lamp as in Figure 7. You can tell whether the ducklings are too warm or too cold by how they behave. Figure 7 illustrates how ducklings react to the warmth of a lamp. When they huddle close to each other they feel cold, the heat source is not close enough. When the temperature is too high the ducklings will try to get as far away from the heat as they can. If the ducklings move freely throughout the cage then the temperature is right for them.

From about two to four weeks the ducklings are kept on rice husk or straw with plenty of fresh air and sunlight. During the day they are kept confined and provided with a mixture of feed and clean drinking water. Simple bamboo containers are used for feeding and watering. From four to eight weeks the ducklings are provided with 0.30 m x 0.30 m floor space per bird. In the morning they are given clean water and a mixture if feed. After some minutes of

feeding, they are allowed to forage in safe water areas. They are brought back to the house before dark. A small quantity of feed is given before putting them inside the house. This encourages the ducklings to return home with their caretaker.

Figure 6. Sexing ducklings

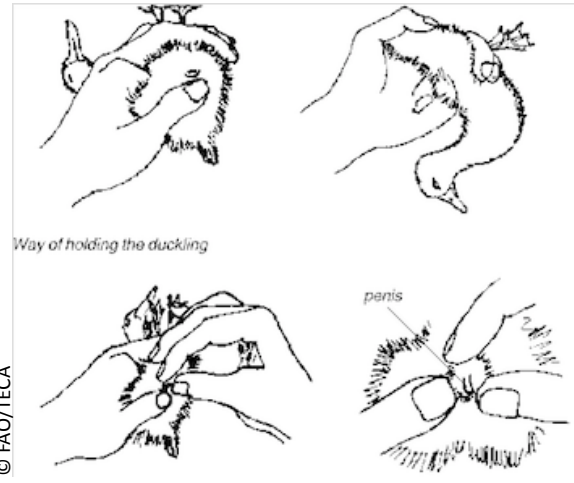
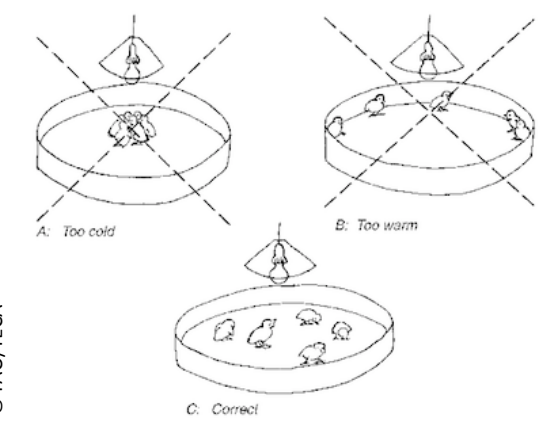


Figure 7. Reaction of ducklings to light



5.1 Drinking water

The presence of drinking water is very important for ducklings. There must be sufficient, clean water present, otherwise the ducklings will become sick. You have to make sure the ducklings do not try to swim in their drinking water. This not only makes the water dirty, but it can also make the ducklings sick. Adult ducks have a layer



of fat over their feathers which prevents the feathers from getting wet. In a natural situation a mother duck will also rub fat into the feathers of the ducklings that she has hatched herself. The feathers of ducklings from an incubator do not have fat over them to begin with. Ducklings cannot rub fat into their own feathers until they are about three weeks old. This is not a problem as long as they do not try to get into water. You can stop them from sitting in the drinking water by putting stones in the bowl or putting chicken wire over the top.

5.2. Feed

Newly hatched ducklings need special feed. You can buy this or prepare it yourself.

6. Duck keeping systems

There are many ways in which you can keep ducks. In practice farmers can adapt these types to their own needs and the materials available.

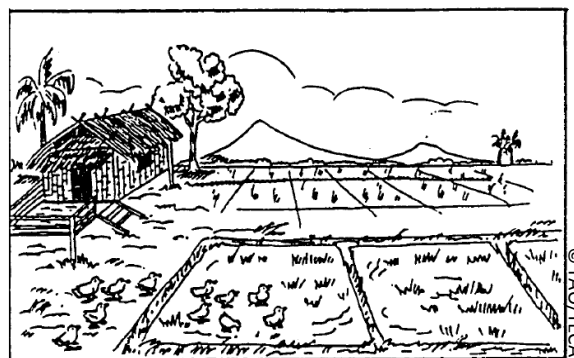
Duck keeping combines well with other forms of farming. In these systems the different forms of production complement each other and the farmer will have better production and more profit.

- Waste and by-products are used. For example duck manure is used instead of wasted. In fishponds it is directly used for fertilizing the pond which increases fish food; in rice fields ducks eat harmful insects and snails, this is a help for the rice and at the same time the ducks get nutritious food.
- Certain inputs are used more efficiently. For example a fishpond is used for fish and for ducks at the same time. Ducks grow better if they have access to a pond.
- The farmer spreads risks. For example if the rice yield is low there is still a yield of eggs and duck meat.

In a free-range system, ducks are only kept enclosed at night. During the day the ducks are free to roam outside in search of food. They are brought inside at night by putting some extra food in the shelter. The ducks only require night shelter and nests for laying eggs. Ducks will stay around the place, provided you treat them well. An advantage of this system is that the ducks go to the feed and harvest it themselves. This way, nutrients become available that the farmer cannot reach otherwise. Some farmers in Asia herd their flocks to graze large areas after the rice harvest.

In a confined system, ducks are kept enclosed permanently, either in a covered shelter (indoor system) or with a run in the open. The ducks stay in the same place. It is easy to keep an eye on them and check them. An outside run makes it easier to give the ducks access to water, as a pond can be put in the open run area.

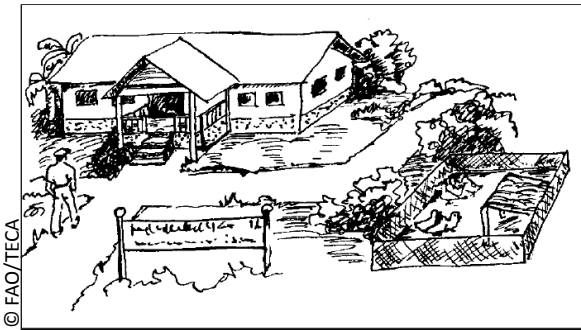
Figure 8. Free range housing system



An indoor system is used large-scale duck farms, where the production is mechanised to reduce labour costs. The system requires more investment than the other two systems of housing. Not only do you need to build the shelter, but you also have to provide all feed and water and clean it regularly. If properly managed, growth can be fast and production cheap.

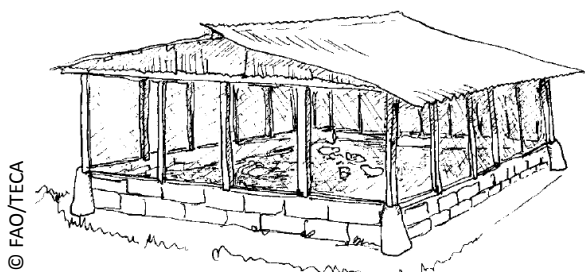


Figure 9. Confined housing system



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Figure 10. Indoor housing system



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6.1 How to choose the system that fits best in your conditions?

Your objectives will determine which system you choose. It is recommended that you start with a small flock and test the system of your choice and the potential of the market. In a free range system you may lose your ducks easily to predators or thieves; while in an indoor system financial inputs may be substantial.

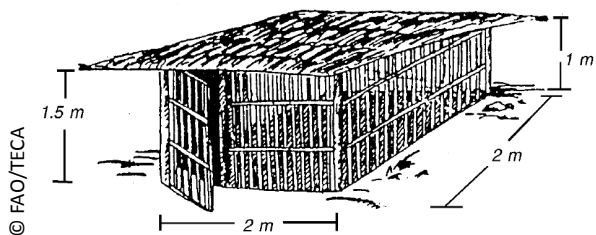
7. Housing

When you choose to keep ducks, you have to provide some kind of shelter for them. Ducks lay their eggs during the night and in the early morning, within three hours of sunrise. By keeping ducks inside at night you can ensure that they lay their eggs in a confined space. Nesting boxes are not necessary, but if you provide them the ducks will use them. An advantage of nesting boxes is that they are easy to clean. Eggs laid in nesting boxes will be cleaner, and eggs which look clean are easier to sell than dirty ones.

7.1 Night shelter

Housing for small-scale duck keeping should not require too much care and maintenance. A night shelter should be sufficient and does not require much space per duck: 1 m² is enough for five to six ducks. If the ducks are going to make use of the shelter during the day as well, then they need more space. In that case 0.5 m² is needed per duck. It does not matter what kind of material you use to make the shelter. Bamboo, wood or chicken wire are all fine as long as the holes are small, so the ducks cannot go through. The shelter must be well ventilated when the ducks are inside. Fresh air is important to prevent the ducks developing respiratory problems. Diseases which are spread through the air can be prevented by good ventilation. Air circulation in the shelter makes the temperature lower. The temperature should not be lower than 10 to 15°C for Peking ducks or 20°C for Muscovy ducks and other ducks from tropical climates.

Figure 11. Night shelter for 20 to 25 ducks



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7.2 Separate laying area

It is very convenient to make a separate laying area within the night shelter. Ducks prefer to lay their eggs in a dark, protected space. Nesting boxes offer ducks a sheltered place to lay their eggs. The eggs laid in these boxes are easier to collect.

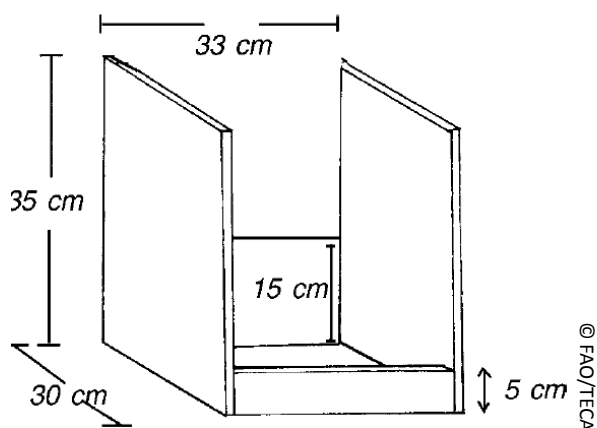
Ducks prefer to lay at ground level so you can place the construction on the floor. It is best to attach the construction to the back



wall of the night shelter. In this way the ducks can sit quietly, away from the rest of the flock, when they are laying.

When building nesting boxes you need to make one box for every three to six ducks. A simple construction is one with side walls of 30 cm x 35 cm. Assemble these at a distance of 33 cm from each other. Attach them to each other at the back by means of a raised edge 15 cm high. Attach a raised edge of 5 cm height at the front. Place straw in the nesting boxes and clean them regularly.

Figure 12. Nesting box



7.3 Floor

The type of floor depends on where you place the night shelter. If you build a night shelter above water, the floor can be made of open slats using wood or bamboo. It is not a good idea to use chicken wire or a metal grate as these do not give the ducks' feet enough support, and can damage their feet. Floor slats should be 2 cm thick and 5 cm wide in order to be strong enough. Leave about 1 cm between the slats. These gaps will ensure that there is sufficient ventilation at night. Another advantage of these gaps is that spilled food and droppings will fall straight into the water, whereas the eggs will stay in the shelter. This makes

cleaning the shelter easy and it fertilises the pond below. If you cannot build the shelter over a pond then the floor does not need to be slatted. You will have to clean out nest material and manure more often to prevent diseases from spreading.

7.3.1 Deep litter system

On a closed floor the litter may sit for some time while a new lot is spread every day. Litter prevents dirt and dampness from forming a hard layer on the floor. Straw or rice chaff make good litter. Sawdust can also be used for litter, but you must make sure that there is no paint in the sawdust as this can poison the ducks. It is best in combination with longer fibre. Any fibre will do as long as it is dry and organic. The litter must be kept clean by replacing it regularly, especially in the nesting boxes. Litter that is damp and moldy not only causes sickness in the ducks, but damages the eggs so that they rot or do not hatch. Ducks are very sensitive to mold in litter. Use this litter in the compost heap.

7.4 Feeding troughs

Ducks kept in a free-range system do not need much equipment for feeding. Scattering the correct amount of feed on a clean spot each evening is sufficient. If you decide to feed the ducks when they are in the night shelter then you need to use containers for the feed. This way the food stays clean and the ducks do not trample on it. Ducks are very messy eaters. If you put food in containers you must make sure you can clean the area around them easily. A large bowl with a flat bottom or a hollowed out tree trunk as shown in Figure 13 can be used for feed. To prevent spillage you can use a feeding trough like the one in Figure 13. The anti-waste lip prevents a



large amount of the food being spilled. You can adjust the sizes of the trays to the size of the bird. Sometimes wild birds will eat out of the feeding troughs. To prevent this food waste, place a low roof over the feeding trays. Wild birds will not usually go under such a low roof.

Figure 13. Feeding troughs

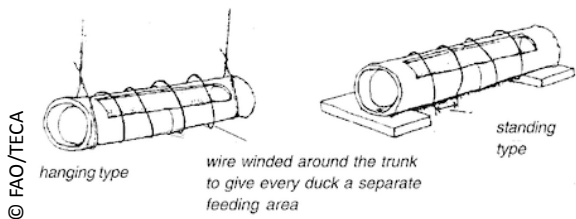


Figure 14. Troughs with anti-waste lip

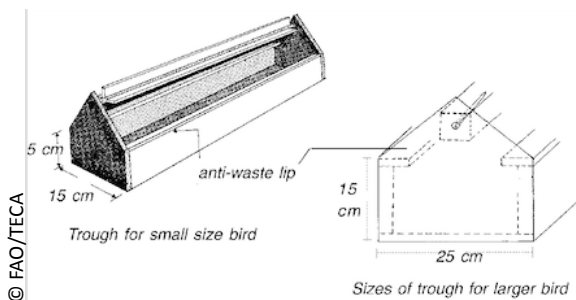
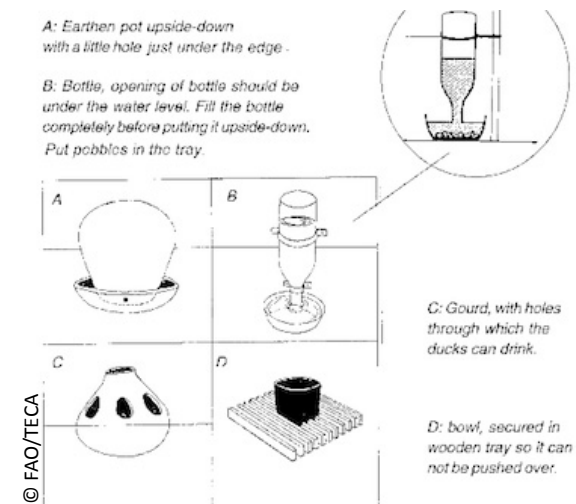


Figure 14. Drinking systems



7.5 Drinking water systems

Ducks need water day and night. By making a pond, or putting down a bowl of water you solve the problem of access to water

during the day. It is very important that ducks always have access to clean drinking water. Young ducks that do not get enough water will not grow well and will become sick. Adult ducks that do not have enough water will lay fewer eggs. A serious water shortage will kill ducks (and ducklings) quickly. As with the feed trays, put water in shallow bowls that do not tip over if a duck stands on the edge. Check the water bowls once or twice every day to make sure that there is enough water and that it is clean. Figure 16 shows some types of water container that prevent the water from becoming dirty quickly. It is important that the ducks cannot immerse themselves in their drinking water, as that makes it dirty very quickly. However, the water must be deep enough for the ducks to be able to put their heads under water. They need to do this to clean their eyes. If they cannot do this, dirt becomes caked around their eyes. In extreme cases this can lead to blindness. Ducks also use their drinking water to clean food remains off their beaks.

7.6 The importance of water

Give ducks access to water for cleaning in the form of a pond or a puddle of clean water, or even just a large container with water in it. If it is not possible to keep ducks near water the whole day it is sufficient to place a tub of water out in the form of a drained stone or slatted floor for them in the mornings and evenings. This will allow them to keep themselves clean and therefore healthier. Avoid putting water on top of the litter without draining what spills, as the litter must remain dry as possible. Different sorts of ducks differ in their water requirements. Peking ducks need water to keep their body temperature at the right level. This is not necessary for Muscovy ducks as these are originally tree-dwellers.



Some types of duck also need access to water to mate. Remember that water can be a source of disease and vermin. Pools, ponds, troughs or tubs of water all need to be kept clean and hygienic.

8. Daily care of ducks

When the housing is arranged well, including feeding troughs, drinking water equipment and access to bathing water, you can then acquire ducks. In the chapters before, choice of breeds, breeding and raising and caring for ducklings have been treated. Also different systems have been discussed and you must have chosen one. Following on from this chapter you find information on health care, feeding and the products. The overview below provides a short summary of daily care in order to give you an idea of things that need to be done.

8.1 Morning

- Let the ducks out of the shelter.
- Collect the eggs.

- Give fresh drinking water.
- If there is no pool of water, put out fresh bathing water.
- Clean the shelter and repair if necessary.
- Sell the eggs if you wish.

8.2 Evening

- Scatter fresh straw or rice chaff if litter is wet.
- Give ducks fresh drinking water.
- Feed ducks.
- Shut ducks up for the night.

9. Agro-ecological zones

- Tropics, warm
- Subtropics, warm/mod cool

10. Objectives fulfilled by the project

10.1 Women-friendly

The technology is not labor intensive can therefore be adopted by women.